Instructions. Part I: Do each of the following 8 problems. Each problem is worth 5pts. Show all appropriate details in your solutions. Calculators are not allowed. Good Luck! When you turn this in, please pick up Part II which has 4 problems.

1. Solve the linear equation $\frac{1}{2}x + 7 - \frac{1}{4}x = \frac{19}{2}$.

2. Solve the formula $A = P + Prt$ for $P$.

3. Solve the equation $\frac{1}{2}x^2 + \frac{3}{4}x = 1$.

4. Solve the equation $\frac{4}{x - 1} + \frac{7}{x + 7} = \frac{5}{x - 1}$.
5. Solve the radical equation $\sqrt{2x - 5} - \sqrt{x + 1} = 1$. Check all proposed solutions.

6. Solve the inequality $x^2 + 7x > -10$. Write your answer in interval notation.

7. Solve the inequality $|3 - 2x| \geq 5$. Write your answer in interval notation.

8. Given that $y$ varies inversely as the square of $x$, and $y = 3$ when $x = 2$, write an equation that expresses the relationship between $y$ and $x$. 
Instructions. Part II: Do each of the following 4 problems. Each problem is worth 5pts. Show all appropriate details in your solutions, you may use a calculator to compute numbers.

9. The cost to install a new carpet in an office is determined by a $550 fixed fee plus a fee of $45 per square yard of floor space to be covered. How many square yards of floor space can be carpeted at a cost of $3800? Round answer to the nearest square yard.

10. An investment of $2500 is made at an annual simple interest rate of 5.5%. How much additional money must be invested at an annual simple interest rate of 8% so that the total interest earned is 7% of the total investment?

11. The height of a model rocket in feet is given by $h(t) = -16t^2 + 220t$, where $t$ is the number of seconds after the launch. How many seconds after the launch will the rocket be 350 feet above the ground? Round to the nearest tenth of a second.

12. The maximum load that a cylindrical column of circular cross section can support varies directly as the fourth power of diameter and inversely as the square of its height. If a column 3 feet in diameter and 12 feet high supports upto 16 tons, how much can a column 6 feet in diameter and 20 feet high support? Round your answer to the nearest tenth of a ton.